

## **TITLE**

### **EXERCISE DEVICE**

#### **BACKGROUND OF THE INVENTION**

##### **Field of the Invention**

5           The present invention relates to an exercise device,  
and in particular to an exercise device provided with a  
combo stationary bicycle and running machine to provide a  
wide variety of interactive exercise options.

##### **Description of the Related Art**

10           Exercise devices of various types are well known and  
popular. One widely used exercise device is a running  
machine, i.e. a treadmill 10, comprising a belt 13 driven  
by roller shafts 15a and 15b, as shown in FIG. 1.  
Settings such as speed are input from a panel 12 and a  
15           handrail 11 is held while running on the belt 13. The  
front and back roller shafts 15a, 15b either actively  
drive the belt 13 as the user 1 runs or walks thereon,  
or, in passive mode, freely rotate, driven by user tread  
activity producing friction on the belt 13.

20           Another widely used exercise device is a  
conventional stationary bicycle 20, comprising a seat 21,  
a plurality of pedals 23, a handrail 25 and a panel 27,  
as shown in FIG. 2. The user 1 sits on the seat 21 and  
holds the handrail 25 while cycling on the stationary  
25           bicycle 20, and the cycling speed and distance are shown  
on the panel 27 coupling to the pedals 23.

          However, with the conventional devices, exercise is  
often repetitive and boring, especially when performed

indoors. Further, both the conventional devices provide only a very limited range of exercise experience, and thus, little motivation or interest to the user.

#### **SUMMARY OF THE INVENTION**

5       Accordingly, an object of the present invention is to provide an exercise device, which includes both treadmill and stationary bicycle functions, providing walking, running, and cycling experiences to make exercise routines fresh and motivating.

10       Another object of the present invention is to provide an exercise device, which has a display or other simulation apparatus, offering the user a simulated environment for both mental and physical interactivity.

      To achieve foregoing and other objects, the present  
15       invention is directed to an exercise device providing treadmill and stationary bicycle configurations, which includes a running device with a tread belt, a bicycle device with a wheel and a pair of pedals connected to the wheel, and a transmission device detachably connecting  
20       the tread belt and the wheel.

      A preferred embodiment of the present invention has a running device with a tread belt, a bicycle device with a wheel and a pair of pedals connected to the wheel, a transmission device detachably connecting the tread belt  
25       and the wheel, a controlling device comprising a controller connected to the running device and the bicycle device for controlling the running device and the bicycle device and a control panel for enabling input of operational settings of the exercise device to the

controller, a sensing device for detecting exercise  
information of the running device and the bicycle device,  
and sending a signal related to the exercise information,  
a computer module comprising a program of an interactive  
5 game for the running device and the bicycle device and a  
processor performing the program, and a displaying device  
connected to the computer module for showing the  
interactive game thereon according to a plurality of  
parameters of the program, in which the computer module  
10 receives the signal related to the exercise information  
from the sensing device to modify the parameters of the  
program in response to the exercise information.

A detailed description is given in the following  
embodiments with reference to the accompanying drawings.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

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The present invention can be more fully understood  
by reading the subsequent detailed description and  
examples with references made to the accompanying  
drawings, wherein:

20 FIG. 1 is a schematic view of a conventional  
treadmill;

FIG. 2 is a schematic view of a conventional  
stationary bicycle;

25 FIG. 3A is a schematic view of an exercise device  
200 of a first embodiment of the present invention;

FIG. 3B is a rear view of the exercise device 200 of  
FIG. 3A;

FIG. 3C is a side view of the exercise device 200 of  
FIG. 3A;

FIG. 3D is a rear view of the exercise device 200 of FIG. 3A, with the exercise device deployed in a stationary bicycle configuration;

FIG. 4A is a flowchart showing an example of  
5 operation of the exercise device 200 according to the first embodiment of the present invention;

FIG. 4B is a flowchart showing a further example of operation of the exercise device 200 according to the first embodiment of the present invention;

10 FIG. 5A is a schematic view of an exercise device 300 of a second embodiment of the present invention;

FIG. 5B is a side view of the exercise device 300 of FIG. 5A; and

FIG. 6 is a schematic view showing the exercise  
15 device with personal display means of a third embodiment of the present invention.

#### **DETAILED DESCRIPTION OF THE INVENTION**

FIGs. 3A to 3D illustrate a first embodiment of the exercise device 200 of the present invention. The  
20 exercise device 200 has a running device 220, a bicycle device 240, a controlling device 260, and a computer module 280.

The running device 220, as shown in FIG. 3A, has an L-shaped frame 222, a treadmill 224, a control panel 226  
25 and a motor 238. The frame 222 is formed with a base 228 with two side boards 233 and two pillars 230 respectively connected to the side boards 233 at the front of the exercise device, and a set of handrails 232 is provided on the top of the pillars 230 for holding. The treadmill

224 has a plurality of roller shafts 234 and a tread belt 236. The roller shafts 234 are rotatably provided between the side boards 233, and the tread belt 236 is disposed on the roller shafts 234. Thus, the roller shafts 234 rotatably support the tread belt 236 so that a user can run on the tread belt 236 smoothly.

The motor 238, which is connected to the roller shafts 234, provides power for the treadmill 224 so that the tread belt 236 is driven to rotate around the roller shafts 234.

It should be noted that, in FIG. 3A, the motor 238 is disposed on the bottom of the pillars 230 to connect to the front roller shaft 234a. However, the motor 238 can be connected to the rear roller shaft 234b, or any other roller shafts 234.

The control panel 226, having a processing unit therein, is disposed on the handrail 232, enabling input of operational settings such as speed and active or passive mode selection of the running device 220. In passive mode, the user 1 can run at any desired speed, controlling the speed of the treadmill 224. In active mode, a predetermined speed of the treadmill 224 is set and followed by the user 1.

The bicycle device 240, as shown in FIG. 3A, has a body 242, a cycling device 244 and a control panel 246. The body 242 is formed with a seat 248 and a brace 250 with a set of handrails 252 provided on the top of the brace 250 for holding. The cycling device 244 has a wheel 254 provided on the bottom of the body 242 and a

pair of pedals 256 connected to the axle 258 of the wheel 254.

The control panel 246, having a processing unit therein, is disposed on the handrail 252, enabling input  
5 of operational settings of the bicycle device 240.

A supporting device is provided under the body 242 as a transmission device to support the bicycle device 240. The supporting device has a spring device 253, which detachably connects the tread belt 236 and the  
10 wheel 254. When the bicycle device 240 is not in operation, as shown in FIG. 3B, the spring device 253 is clutched in a first state so that the wheel 254 is detached from the tread belt 236. On the other hand, when a user is using the bicycle device 240, as shown in  
15 FIG. 3D, the spring device 253 is clutched in a second state so that the wheel 254 is connected to the tread belt 236. Further, the supporting device has a hydraulic device 255, which can be controlled by the user from the control panel 246 to alternatively clutch in the first  
20 state and the second state.

Further, each of the control panel 226 of the running device 220 and the control panel 246 of the bicycle device 240 has a plurality of buttons for setting an interactive game for the running device 220 and the  
25 bicycle device 240. The interactive game is stored as a program in a computer module 280, which will be discussed later.

FIG. 4A is an architecture showing an example of operation of the exercise device 200 according to the  
30 first embodiment of the present invention. The exercise

device 200 has a controlling device 260 and a sensing device 264. The controlling device 260 has a controller 262, which is connected to the running device 220 and the bicycle device 240 for controlling the running device 220 and the bicycle device 240. The sensing device 264, which has a plurality of sensors, is applied for detecting exercise information of the running device 220 and the bicycle device 240. The sensors include a running speed sensor 265 and a running load sensor 266 to detect running speed and load from the running device 220, and a cycling speed sensor 267 and a cycling load sensor 268 to detect cycling speed and load from the bicycle device 240. The controller 262 receives signals of the running/cycling speed and loads from the sensors 265, 266, 267, 268 via a plurality of signal lines 272, 273, 275 and 276, and transforms the signals to exercise information. Then, the controller 262 sends a signal related to the exercise information to the control panel 226 of the running device 220 via the signal line 271, or to the control panel 246 of the bicycle device 240 via the signal line 274, to show the exercise information to the user. The controller 262 controls the motor 238 to drive the tread belt 236 via the signal line 277. The controller 262 also controls the hydraulic device 255 (i.e. the supporting device) to alternatively clutch in the first state and the second state via the signal line 278. Further, the controller 262 is connected to the computer module 280 via a signal line 279.

It should be mentioned that any signal transmission device can be applied in the signal line configuration of

the controlling device 260, which is not limited to the first embodiment in FIG. 4A. For example, a further configuration of operation of the exercise device 200 according to the first embodiment of the present invention is shown in FIG. 4B, in which two controllers 262a and 262b are applied to separately controls the running device 220 and the bicycle device 240.

The computer module 280 has a processor, i.e. a CPU 282, to perform a gaming program 286 stored therein. The program 286 provides an interactive game for the running device 220 and the bicycle device 240.

The computer module 280 receives the signal related to the exercise information from the controlling device 260 to modify the parameters of the program 286 in response to the exercise information.

Further, a displaying device 284 is connected to the computer module 280 for showing the interactive game thereon according to a plurality of parameters of the program 286. When the program 286 relates to a two-dimensional interactive game, the displaying device 284 can be a two-dimensional display, which includes a projector, a plasma display, an LCD, a large electronic display (LED), a computer display, a television display, or a television wall. On the other hand, when the program 286 relates to a three-dimensional interactive game, the displaying device 284 can be a three-dimensional display, i.e. a virtual-reality (VR) displaying system, which includes a VR helmet, a VR goggles, a VR projector or a three-dimensional projector.



FIGs. 5A and 5B illustrate a second embodiment of the exercise device 300 of the present invention. The exercise device 300 has a running device 320 and a bicycle device 340. Further, a controlling device 260 and a computer module 280 are also provided in the exercise device 300.

In the second embodiment, a transmission device 310 is provided for detachably connecting the running device 320 and the bicycle device 340. The transmission device 310 has an axle 312 rotatably provided on the body 342 of the bicycle device 340. A first linking belt 314 is provided between the axle 312 and the axle 258 of the pedals 256 to link the pedals 256 to the axle 312, and a second linking belt 316 is provided between the axle 312 and the rear roller shaft 234b to link the axle 312 and the rear roller shaft 234b. Thus, the axle 312, the first linking belt 314 and the second linking belt 316 constitute a belt pulley module. It should be mentioned that the second linking belt 316 can be made of elastic material to perform effective transmission even when the position of the body 342 of the bicycle device 340 is changed.

Further, the transmission device can be provided in a variety of configurations, such as a clutch and a gear drive module.

FIG. 6 shows a third embodiment of the present invention, in which a VR helmet 290 is used as the displaying device of the exercise device. In FIG. 6, the VR helmet 290 is connected to the control panel 226 of the running device 220 via the controlling device 260 to

display the interactive game to the user. On the other hand, the VR helmet 290 can be connected to the control panel 246 of the bicycle device 240, or to the controlling device 260, or to the computer module 280.

5 It should be mentioned that wireless connection technique or any other connection system can be applied as the connection system of the exercise device of the present invention.

While the invention has been described by way of  
10 example and in terms of the preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, it is intended to cover various modifications and similar arrangements (as would be apparent to those skilled in the art).  
15 Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.